Dual purpose RF atom/ion source

Mantis Deposition, a supplier of RF atom and ion sources, now offers a conversion kit to allow customers to switch between fully dedicated RF atom source and RF ion source capabilities. The kit consists of a pre-aligned molybdenum grid set (complete with power supplies) which can be readily exchanged with the RF atom source's aperture plate configuration.

RF Atom Source Mode: Neutral, atomic species have been shown to be beneficial in the growth of high-quality compound materials. Molecular gases such as oxygen or nitrogen are many orders of magnitude less reactive than if dissociated into atomic form. Consequently, oxide formation using molecular oxygen commonly requires highly elevated temperatures and/or extended oxidation periods, while molecular nitrogen shows negligible reactivity for most materials. Using dissociated species increases the reactivity by many orders of magnitude and therefore allows oxides or nitrides to be grown at low pressure and at reasonable substrate temperatures. Atomic species carry negligible kinetic energy and therefore allow rapid film growth without generating defects. RF atom sources have been used successfully in many semiconductor film-growth applications, such as GaN, GaInNAs, ultra-thin Al2O3, high-K dielectrics, and are being employed in a range of other applications such as data storage, catalytic films, and surface cleaning with atomic hydrogen.

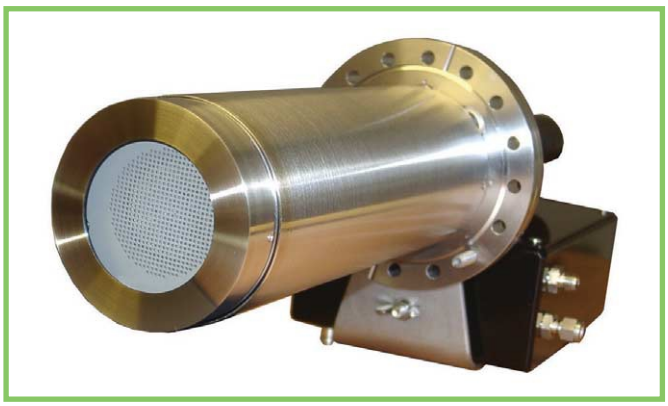
RF Ion Source Mode: Beams of accelerated ions are used to modify and erode surfaces under vacuum conditions. By carefully selecting the energy and composition of an ion beam, this can be used to improve significantly the characteristics of a growing film by both densifying the film and modifying the chemical composition of the film. Alternatively, ion beams can be used to erode (mill) existing films or sputter a target material to project a plume of material for deposition onto a substrate. In the latter case, the growing films can have excellent qualities for many applications owing to the elevated kinetic energy of the sputtered material.

In other news, Mantis has received a one year grant of £90,000 from the UK government for developing an "advanced nanocluster deposition tool." The UK's Department of Trade and Industry is funding the majority of the project. Sharp Laboratories of Europe, the University of Oxford and Instituto de Microelectronica de Madrid in Spain support the grant application. Of the 113 companies that applied, only Mantis Deposition was granted approval for a research project.

The project goals are to design and build a "floating" nanocluster deposition source which will be able to produce accelerated nanoclusters, as well as investigating electrostatic optics to allow the beam to be steered and focussed. This will enable the source to be used in systems where it is difficult to bias the substrate. The optics will allow more complex experiments to be undertaken, by enabling patterning of the nanoclusters.

Mantis already offers commercially available nanocluster deposition sources and systems based upon its "NanoGen" technology. However, in the NanoGen (without the "floating" principle), the substrate must be directly biased for accelerated impact of the nanoparticles.

Some of the applications affected by this new research program are optoelectronics, biosensors and surface physics.



Mantis' conversion kit allows switching between fully dedicated RF atom source and RF ion source capabilities.

TF600 for thin film

BOC Edwards has launched a new addition to its range of vacuum coating systems for thin film deposition processes. TF600 combines a 600mm wide coating chamber, with a high throughput, vacuum-pumping system. It is designed to deliver increased productivity and flexibility in research, development and production of substrates used in the semiconductor, laser and scientific industries.

TF600 incorporates several new design features including the placement of the high vacuum pumping system at the rear of the chamber to provide faster pumpdown. Pumping system options include diffusion, turbomolecular, and cryogenic high vacuum-pumps, and the XDS 35i 'dry' scroll pump for backing and chamber roughing.

Process options include resistance evaporation, electron beam, RF, DC and pulsed DC sputtering. With a variety of chamber heights, loadlock options and multiple source configurations, the TF600 allows customers to address a range of applications and specialist techniques, such as lift off and ion beam processing.

Nikon settle for $145m

Nikon Corp, ASML Holding NV and Carl Zeiss SMT AG have agreed to a comprehensive settlement of legal proceedings and cross-license of patents related to lithography equipment used to manufacture semiconductor devices.

The Memorandum of Understanding is a binding agreement that continues the previously announced stays on all patent disputes pending between the three companies in Asia and the United States. The companies expect to execute definitive settlement and cross-license agreements and dismiss all legal proceedings in November 2004.

As part of the settlement, ASML and SMT will make payments to Nikon.

ASML will pay a total of $87m. An initial payment of $60m will be made in 2004, with the remaining equal instalments due in 2005, 2006 and 2007. SMT will pay a total of $58m. An initial payment of $40m will be made in 2004, with the remaining equal instalments due in 2005, 2006 and 2007.